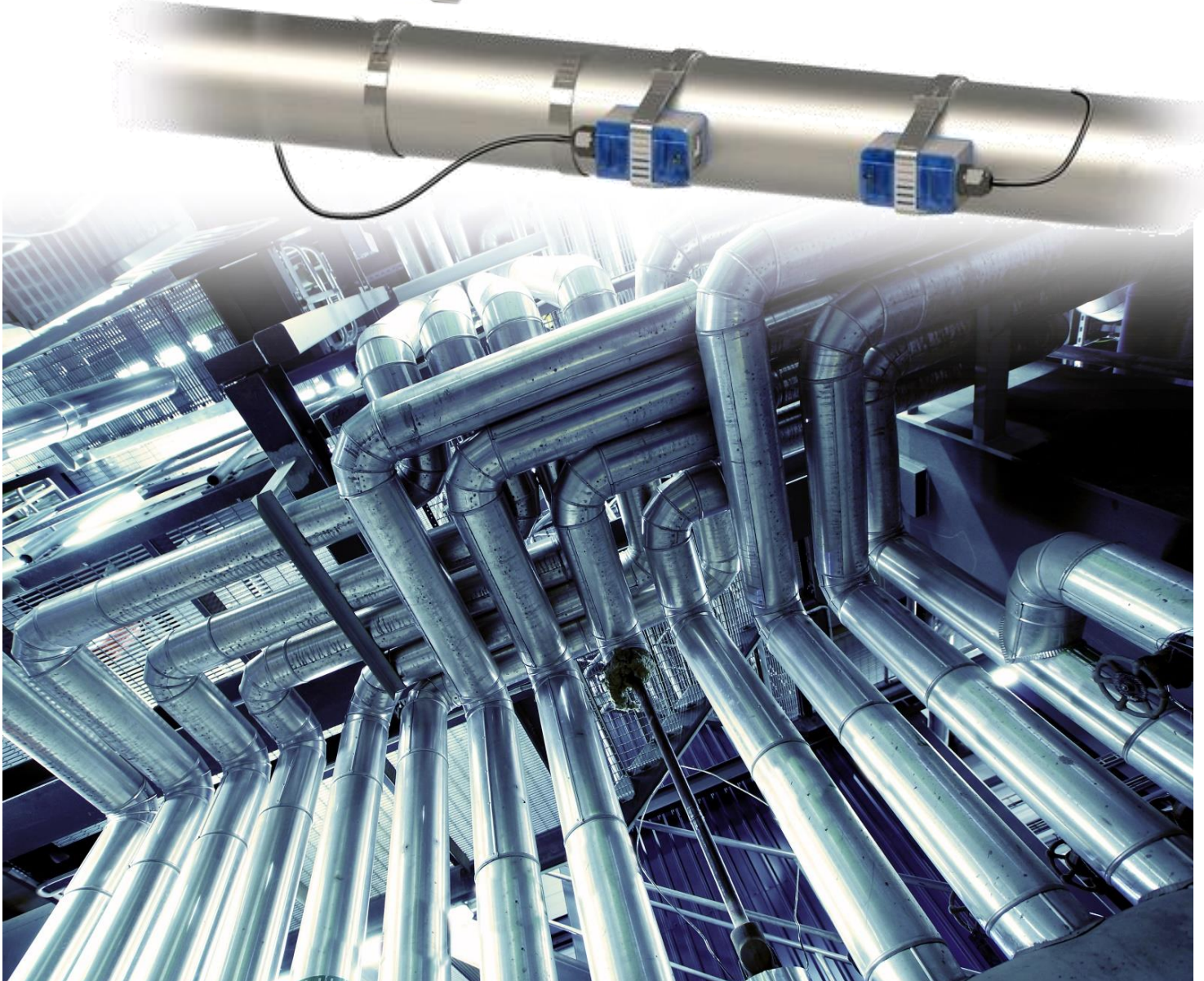# leveltec

LTFM-120
Transit time flow meter

Flowmeter with clamp-on transducers able to use in non-invasive liquid measurement. Microprocessor based, user friendly, field programmable flow measurement technique allows no interruption of the process flow and has low installation cost

- ☐ **2 line LCD display with flowrate, totalizer & signal condition**
- ☐ **Stores up 64 Day/month totalizer daily value**
- ☐ **Wide range velocities of 0,02 to 12 m/s**
- ☐ **Transducers pipe size from 20 to 3000 mm**
- ☐ **Accuracy up to 0,05% of reading**
- ☐ **Transducers including magnetic coupling for installation on ferromagnetic pipes without belt**
- ☐ **Basic data logger function, include date, totalizer, signal condition, etc.**
- ☐ **Response time from 1 second**
- ☐ **Batch control function**

Ultrasonic transducers

Flow

Ultrasonic Signal Path

Down stream transducer

flow

Tdown

Tup   θ

spacing

Upstream transducer

Measuring conditions
Transit time principle

TTP utilizes a pair of ultrasonic transducers which are mounted on the pipe upstream and downstream respectively. Each transducer functions as both ultrasonic transmitter and receiver. The main unit operates by alternately transmitting and receiving a coded burst of sound energy between the two transducers. The transit-times in the upstream direction as well as in the downstream direction are measured. The difference of the two transit times is directly and exactly related to the velocity of the liquid in the pipe,

Fluid types

Virtually all commonly used clean liquids with small quantity of tiny particles up to concentration < 10000 ppm and particle size less than 80 µm.
Liquid must to be free of bubbles and turbulences

Pipe conditions

Pipe material can be all metals, plastics, fiber glass, etc. , quite all of homogeneous pipes. Allow pipe liner.
Pipe straight run must to be 15 or 30 times pipe diameter as minimum free straight pipe to warranty minimum turbulences.
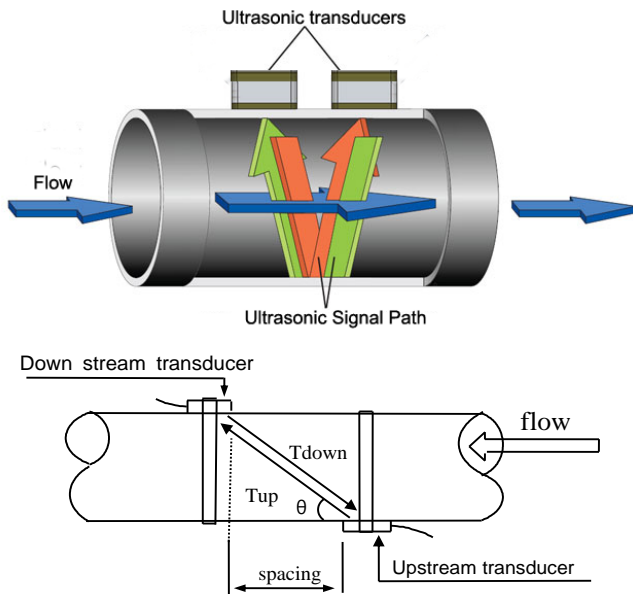
Main Specification

Power supply:
  85 to 260 Vac 50/60 Hz
  10 to 36 Vac/Vdc not insolated (optional 9 to 36 Vdc, 3000 Vdc isolation)
Standard consumption:
  From 2,5 to 18 VA depending of options and features
Dimensions (main unit): 166 x 161 x 126 mm (without glands). **Weight**
Enclosure type (main unit): rail or wall mounting left-hand opening door (right-hand as option).
Enclosure: ABS and polycarbonate UL94-V0 Light-grey base color and transparent cover Sealing is provided by neoprene gasket. Front face polycarbonate. Standard cable glands 1 x PG9 , 2 x PG11, 1 x PG13.5. Protection class IP 65 (NEMA 4).
Protection access: keyboard password + door opening locking or security seals + cable assembling protected by security seals
Display: LCD with backlight 2 x 20 characters
Keypad: 4 x 4 key membrane with tactile action
Language: English, Italian, Turkish (optional)
Standard measuring period: 1 S (damping programmable)
Flow velocity: 0,02 m/s to 12 m/s by-directional with flow direction indication.
Pipe size: from 20mm to 3000 mm depending the sensor type
Lineality (from 0,1 to 12 m/s): +/- 0,5% reading
Repeatability (from 0,1 to 12 m/s): +/- 0,2% reading
Accuracy (from 0,1 to 12 m/s): +/- 1% reading
Velocity resolution: 0,001 m/s (internal resolution 0,0001 m/s)
Internal Alarm (buzzer): user programmable for alarm or other functions
Display data:

  Flowrate 5 digit with decimal point
  Totalizer 8 digit. Forward, Reverse & net values
  Time units. Seccond, minute, hour , day
  Engineering units (Imperial (English) or Metric). M^3, Liter, US Gallon, Imperial Gallon, Million Gallon, Cubic feed,
  US Barrels, Imperial Barrels, Oil barrels
  Other information. Velocity, date, time , signal condition, energy, error codes.
Pipe material entering: by sound speed or standard pipe (Carbon Steel, Stainless steel, Cast Iron, Cooper, PVC, Aluminium, Asbestos, Fiberglass)
Liner material entering: by sound speed or standard liner (Expoxy, Rubber, Mortar, Polypropylene, Polystyrol, Polystirene, Polyester, Polyetylene, Ebonite, PTFE)
Liquid type entering: by sound speed or standard liquid (Water, Sea water, Kerosene, Gasoline, Fuel Oil, Crude Oil, Alcohol)
Standard functions: Bach control function, Signal quality diagnosis, zero setting, Scale factor, Reynolds number,…
Operating conditions (main unit): -15 to 50ºC and 10 to 98% RH without condensations
Cable terminal:
  Supply from 90 to 260 V. Screw connection with tension sleeve, cable available 0,2 to 2,5 mm^2
  Inputs, outputs and supply up to 36 V. Screw connection with tension sleeve, cable available 0,2 to 1,5 mm^2
Basic data storage: Operation parameters and totalization data stored by EEPROM for more than 10 years
Serial communication: Standard RS485 MODBUS (optional USB converter) software nor included

Input options

Current inputs (option CI3): 3 not isolated 4-20 mA input
Sensor supply (option CIL): 24 V DC ± 5% , 100 mA max. for current loop supply
Temperature inputs (option RTD): 2 input RTD for temperature/energy measurements

Energy measurements (optional, version "W")

Flow measurement: by high temperature version "xHT" sensors
Temperature measurement: by 2 PT100 sensors (surface or insertion)
Calculation (optional): by international standards measured in GJ, Kc, KWh or BTU.
Cooling and Heating measurements: Yes
Energy totalizer: including unit or total energy measurement

Output options

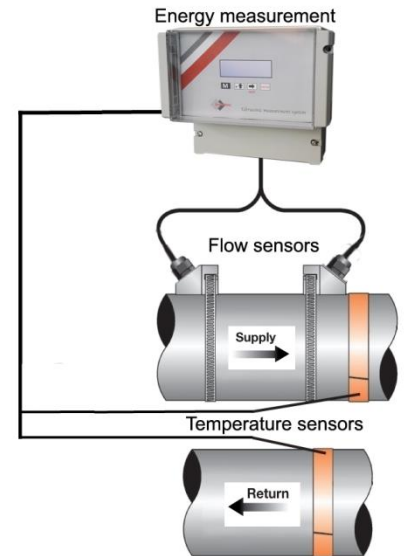**4-20 mA Output:** 0 (4) to 20m mA (flow or energy)
OCT output: configurable as alarm, pulses or frequency output 1 to 9999Hz
Relay output: 2 A30 V, configurable as alarm or pulse output.
RS485: Standard RS85 Modbus protocol
USB output (option U): internal USB converter RS485 MODBUS to USB
Software: Not available

Transducer specification

Clamp on transducers

Type A. Pipe size DN20 to DN 100
Type B. Pipe size DN50 to DN 700
Type C. Pipe size DN300 to DN 3000
Fluid temperature: -10 to 80ºC
Pipe installation: Clamp on
Cable: Shielded transducer cable, PVC cover
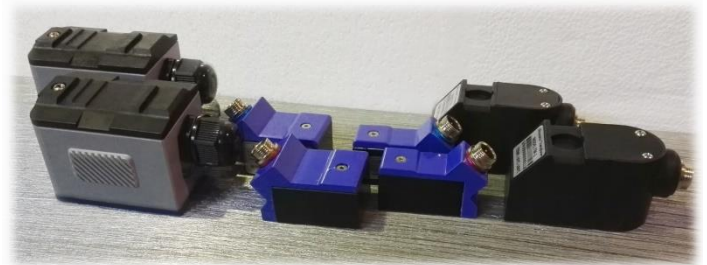**Cable length:** Standard 10 m, maximum length 130 m
Protection: Standard IP 67, optional IP68 (up to 3 m max.)
OPTIONS
High temperature version "xHT": special version -30 to 160ºC
Guided sensors "xRH":
Type A or B reduce the misalignment problems specially in small pipes

Measuring methods

Reflex type, "V" installation: Commonly used with medium size pipe. Wave is reflected once on the pipe.
Increased reflex type, "N" installation: Wave is reflected two times on the pipe.
Double Reflex type, "W" installation: Wave is reflected three times on the pipe. Used in small pipes.
Diagonal mode type, "Z" installation: Direct measure through the pipe without any reflection. Commonly used with big size pipe (or dirty pipes)
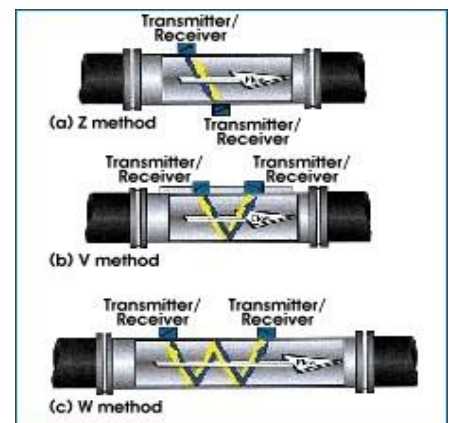
Insertion transducers

Fluid temperature: -20 to 160ºC
Standard accuracy: 1%
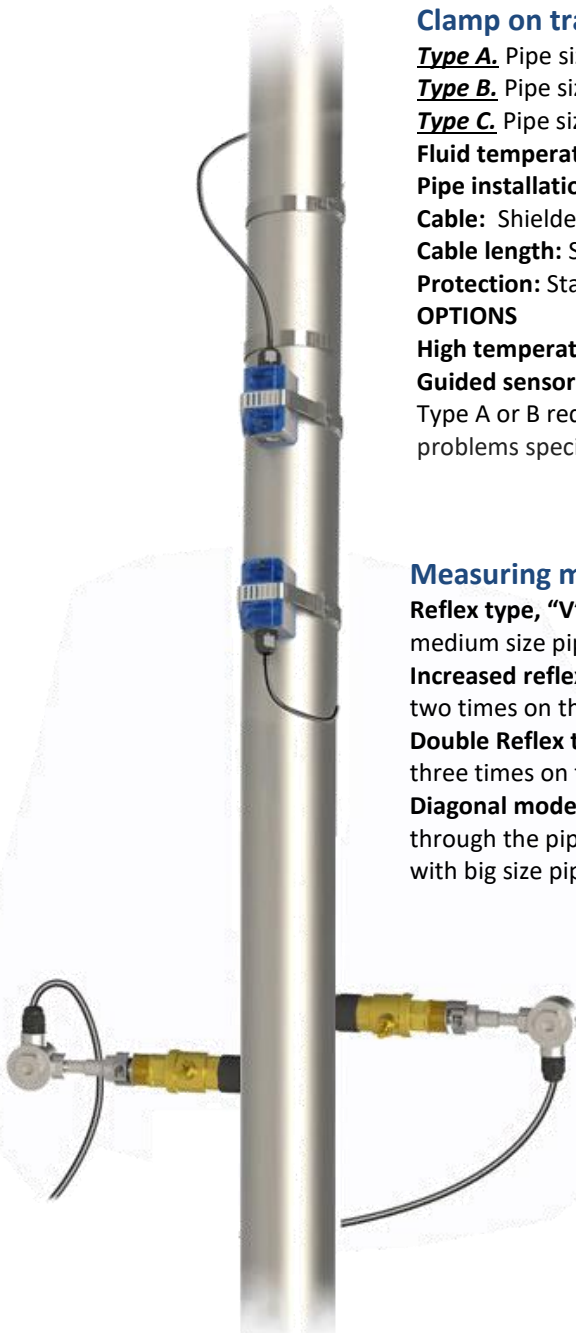**Pipe size:** DN80 to DN 1000
Pipe installation: welded
Cable: Shielded transducer cable 10 m
Maximum cable length: 100 m
Isolation valve: optional
Protection: IP 65

Noteworthy features

Fast and easy

Traceable Calibration Certificate (Optional)

Lockable doors
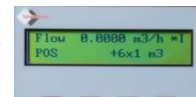
Magnetic clamp sensors

Install the controller
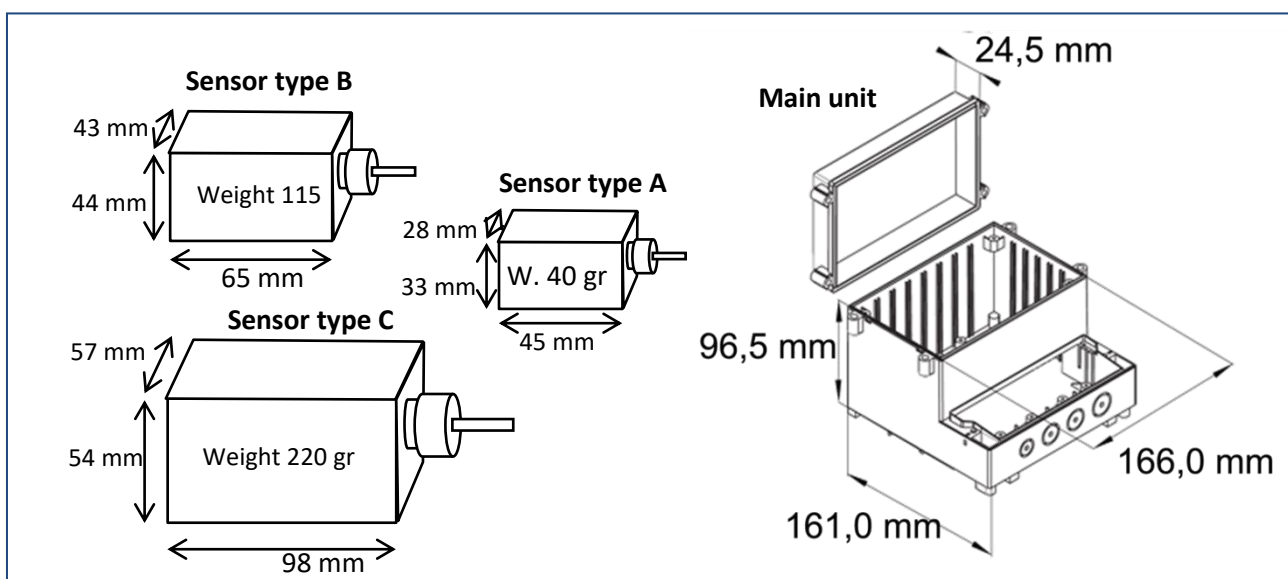
Connect cables

Program the unit

Clean the pipe

Intall the sensors

Ready to measure

Size and weight

Sensor type B

43 mm
44 mm
Weight 115
65 mm

Sensor type A

28 mm
33 mm
W. 40 gr
45 mm

Sensor type C

57 mm
54 mm
Weight 220 gr
98 mm

Main unit

24,5 mm
96,5 mm
166,0 mm
161,0 mm

Packaging list

- ●**Main unit**
- ●**Clamp on transducers with cable**
- ●**High viscosity coupland kit**
- ●**Clamp on SS fixture**
- ●**Instruction manual (English, Italian or Spanish)**
- ●**Conformity + test certificate**

Ordering code

| LTFM120 | X | X | X | X | XXX | XXX | XXX | XXX |

Type: F (flow measurement) /**W** (Energy calculation)

Sensor type : A , B, C, AHT, BHT, ARM, BRM, ARH, BRH

Supply: (2) 90 to 260 V/(3) 9 to 36 Vdc/ (4) 10 to 36 Vac/dc

Communication: 2 (RS232C), 4 (RS485), U (USB)

Temperature input : 000 (none), **RTD (**2 x PT100), **ANA** (2 x 4-20 mA)

Analgog input: 000 (none), **CI3 (**3 x 4-20 mA), **CIL** (3 x 4-20 mA + 24V/100 mA)

Sensors cable length (pair) in meters

Options: (CAL) Calibration certificate, **(000)** Standard, …